

Sown Biodiverse Pastures

A nature-based approach to reverse the degradation of Mediterranean ecosystems

Presented by:
Ricardo Teixeira
Terraprima



Contributing to societal challenges with triple-win solutions

Climate change
Adaptation
Mitigation

...with better farm
management

Soil protection

...with an increase in
soil organic matter

Green growth

...with economic value
added and more
productive systems

2020

- reduced tillage
- no harrowing for shrub control
- adequate grassland management
- higher grassland productivity
- lower chemical inputs

- higher resistance to erosion
- higher water retention and infiltration
- healthier biotic communities
- higher soil biodiversity

- less pollution
- higher biodiversity levels
- healthier trees
- higher biomass production
- higher stocking rate

Soil Thematic
Strategy

Strategy for
Biodiversity

Mitigation and
adaptation to
climate change

Sown Biodiverse Permanent Pastures Rich in Legumes

A Biodiversity Engineering innovation by David Crespo



Permanent, because they are self-maintained during at least 10 years (in some cases, 25 years)

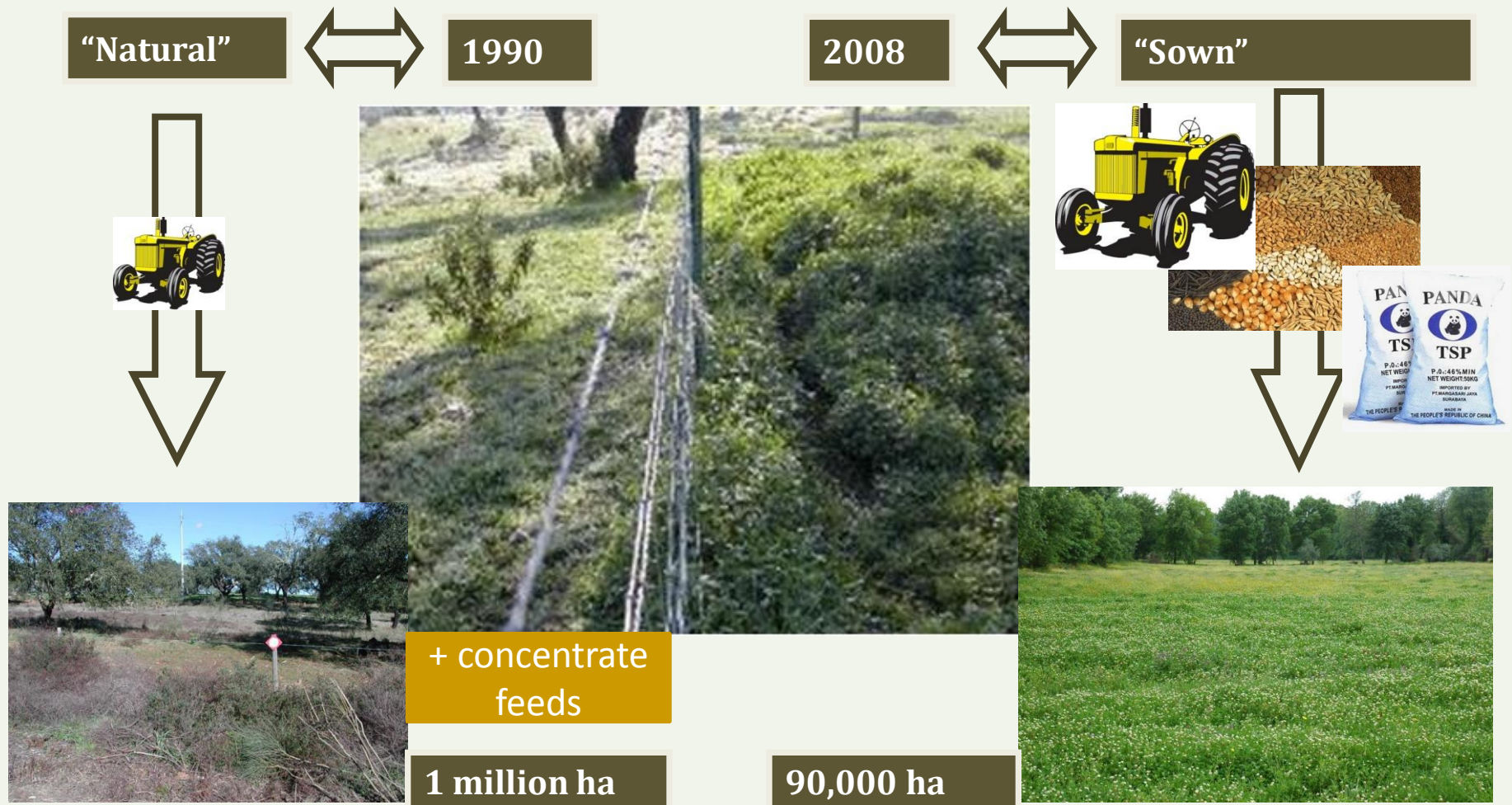
Sown, because improved and selected seeds are introduced (by sowing)

Biodiverse, because up to 20 species or varieties are sown

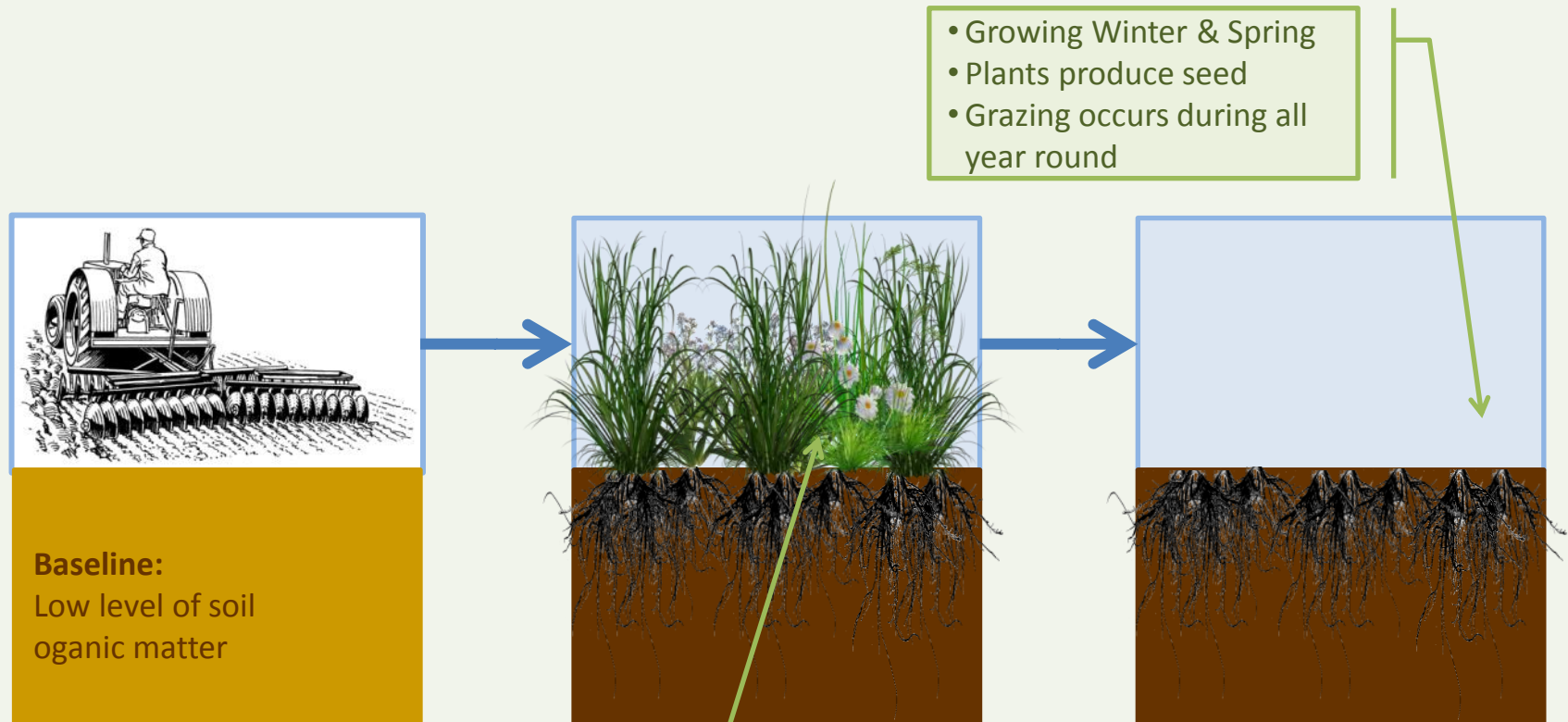
Rich in Legumes, because many plants are legumes, which are a “natural factory” of nitrogen, avoiding the use of synthetic fertilizers



Sown Biodiverse Pastures: a nature-based approach?

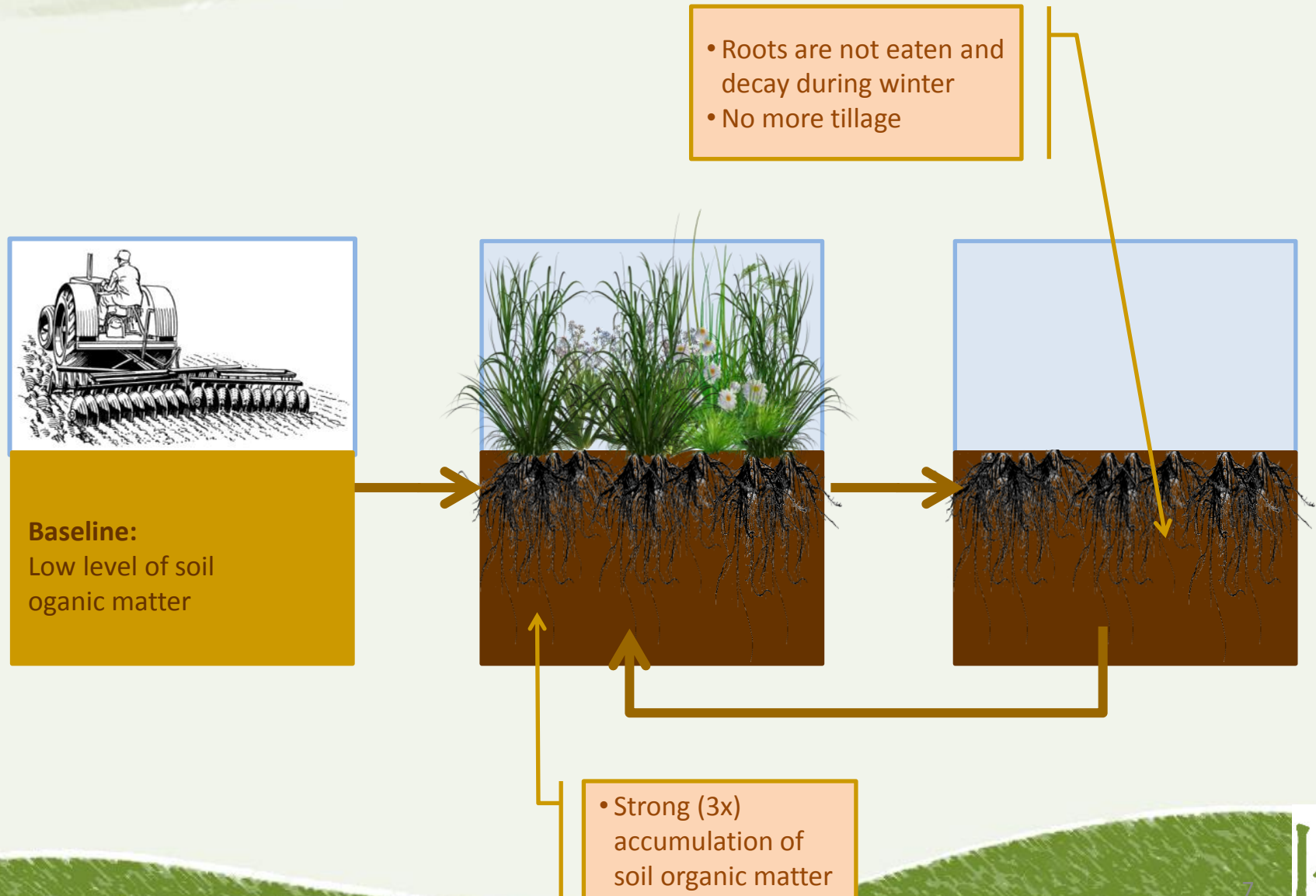


Sown Biodiverse Pastures as a nature-based approach

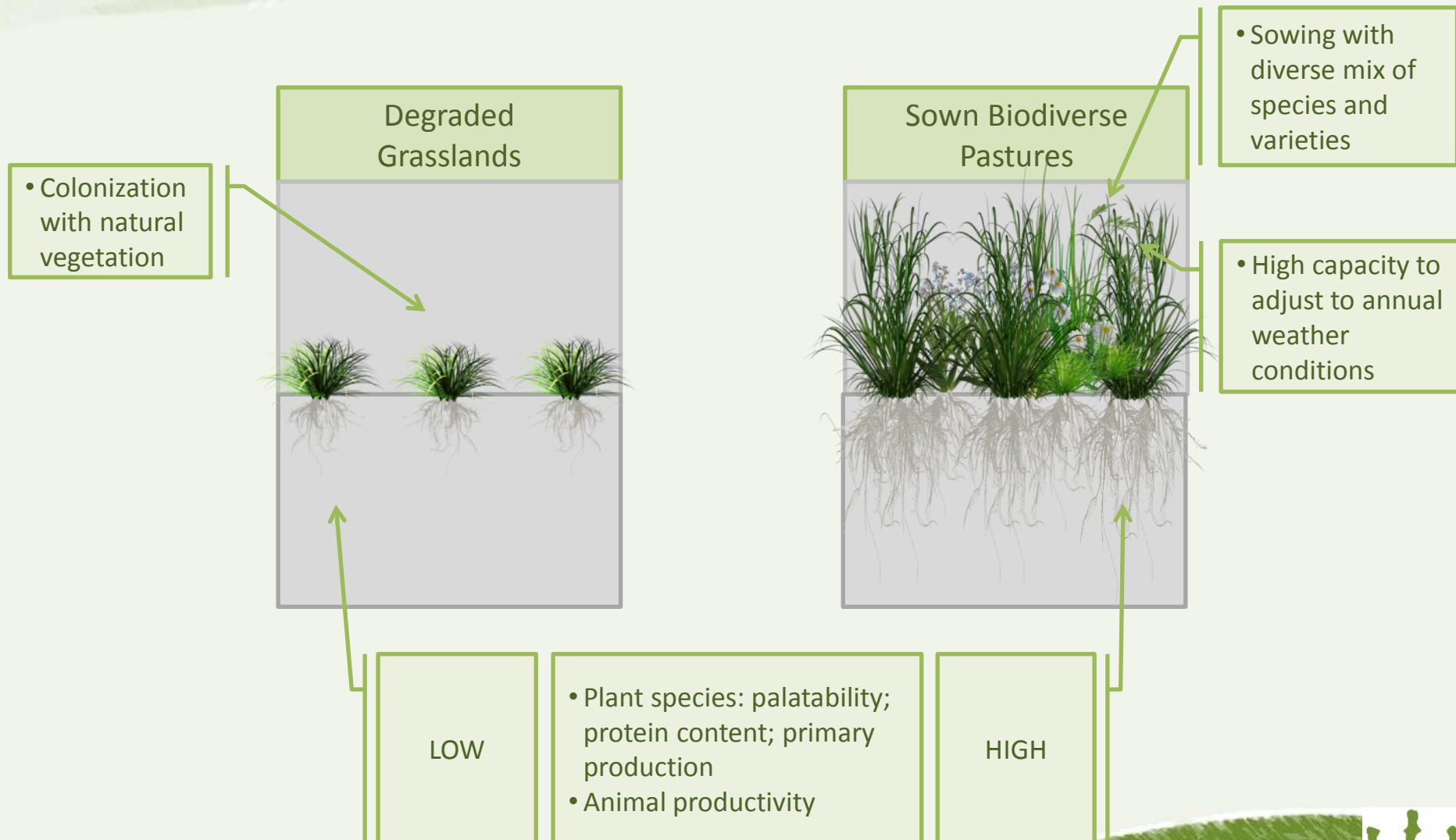


Teixeira, R.F.M., Proença, V., Crespo, D., Valada, T., Domingos, T. (2015). The use of biodiversity in engineered pastures in designing win-win solutions for arid and semi-arid ecosystems: a conceptual framework. *Ecological Engineering*, 77, 85-97.

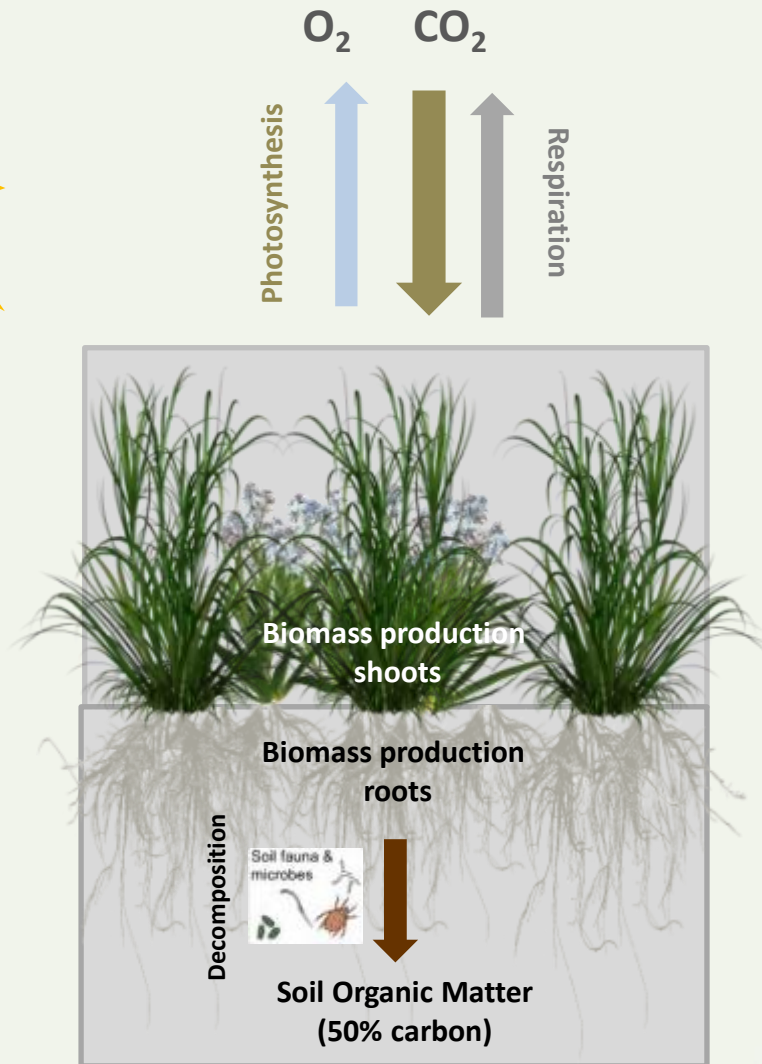
Sown Biodiverse Pastures as a nature-based approach



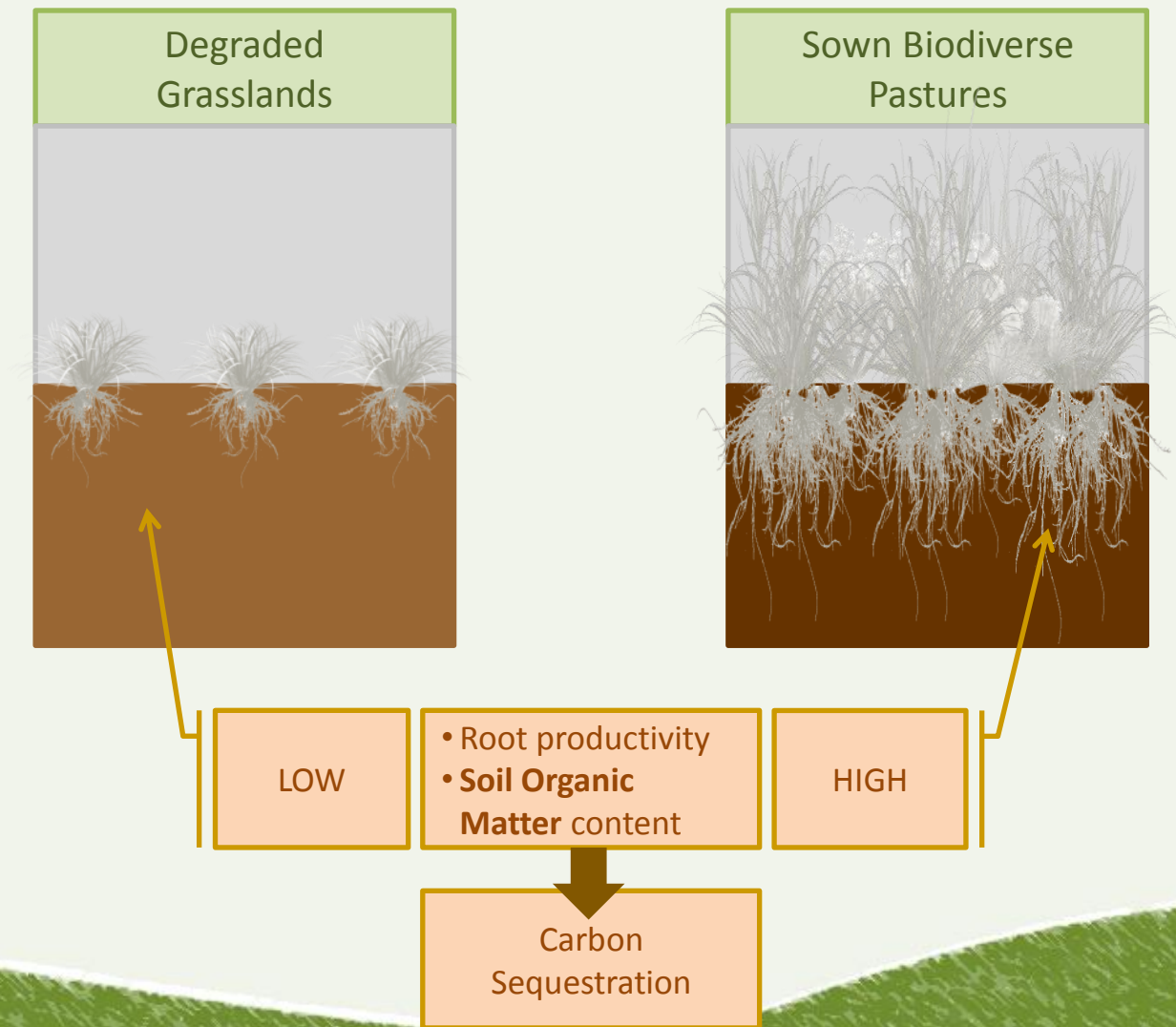
Comparing Systems: Productivity



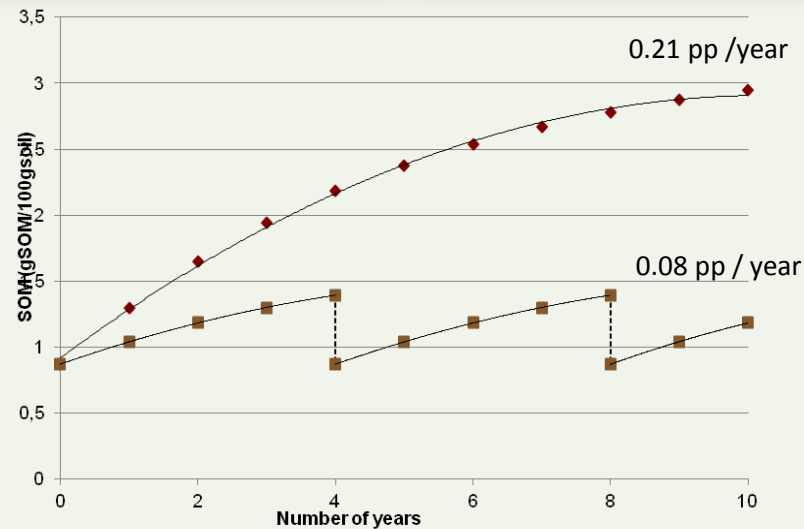
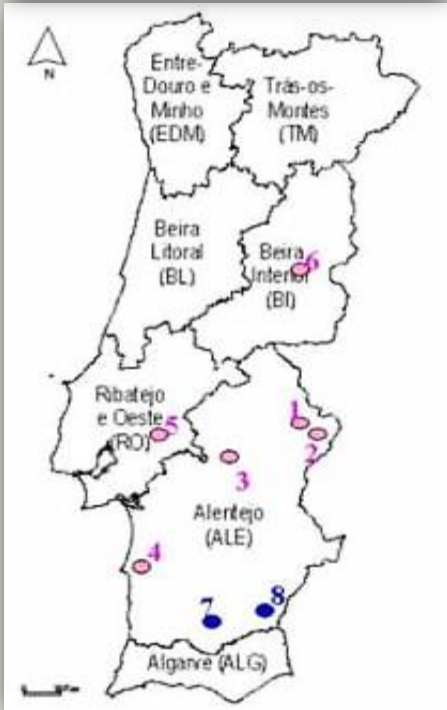
Managing soil organic matter is the key to carbon sequestration and soil protection



Comparing Systems: Carbon Sequestration



Calculation of the Carbon Sequestration Factor



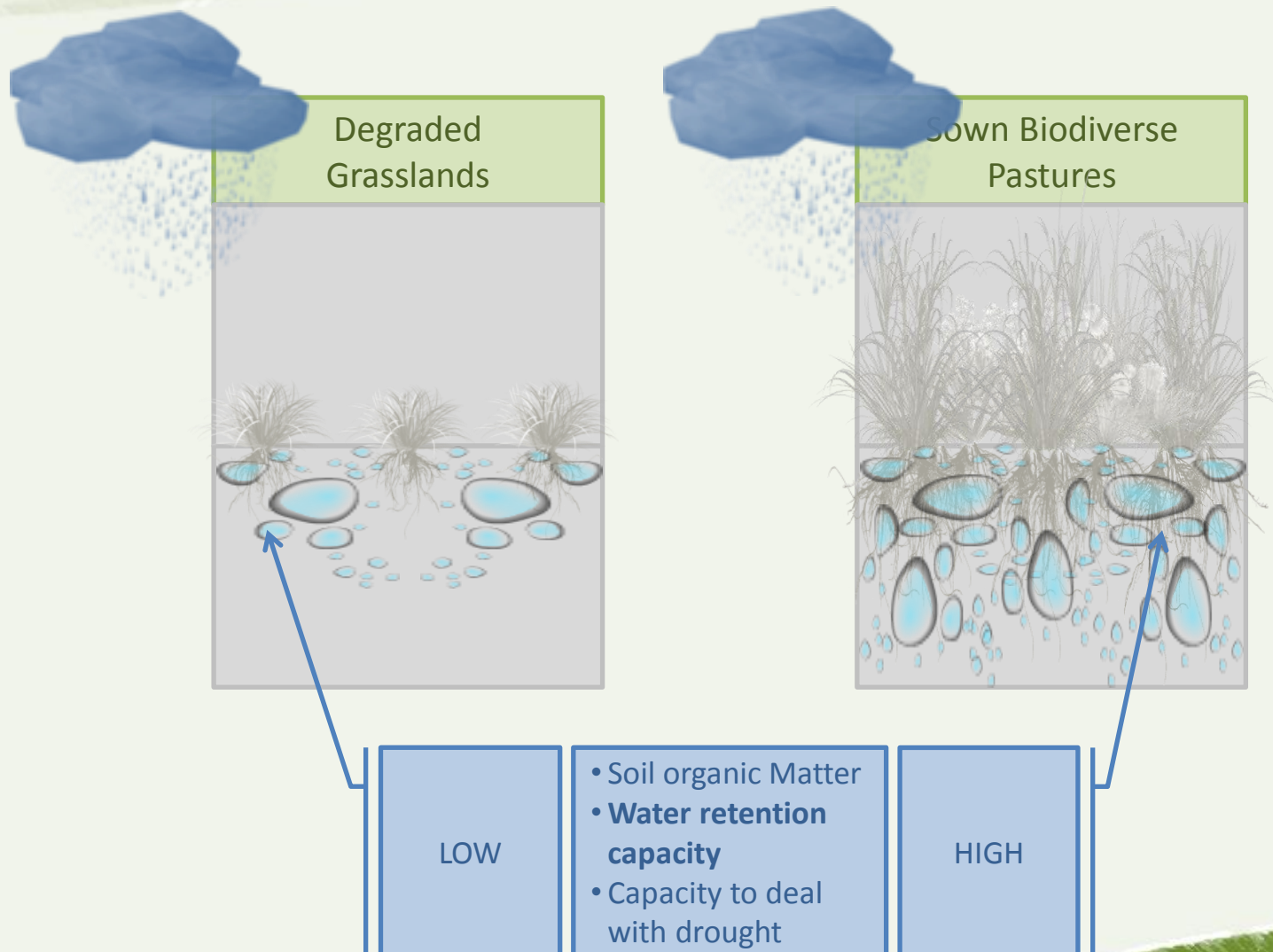
Sown Biodiverse Pastures

Degraded Grassland

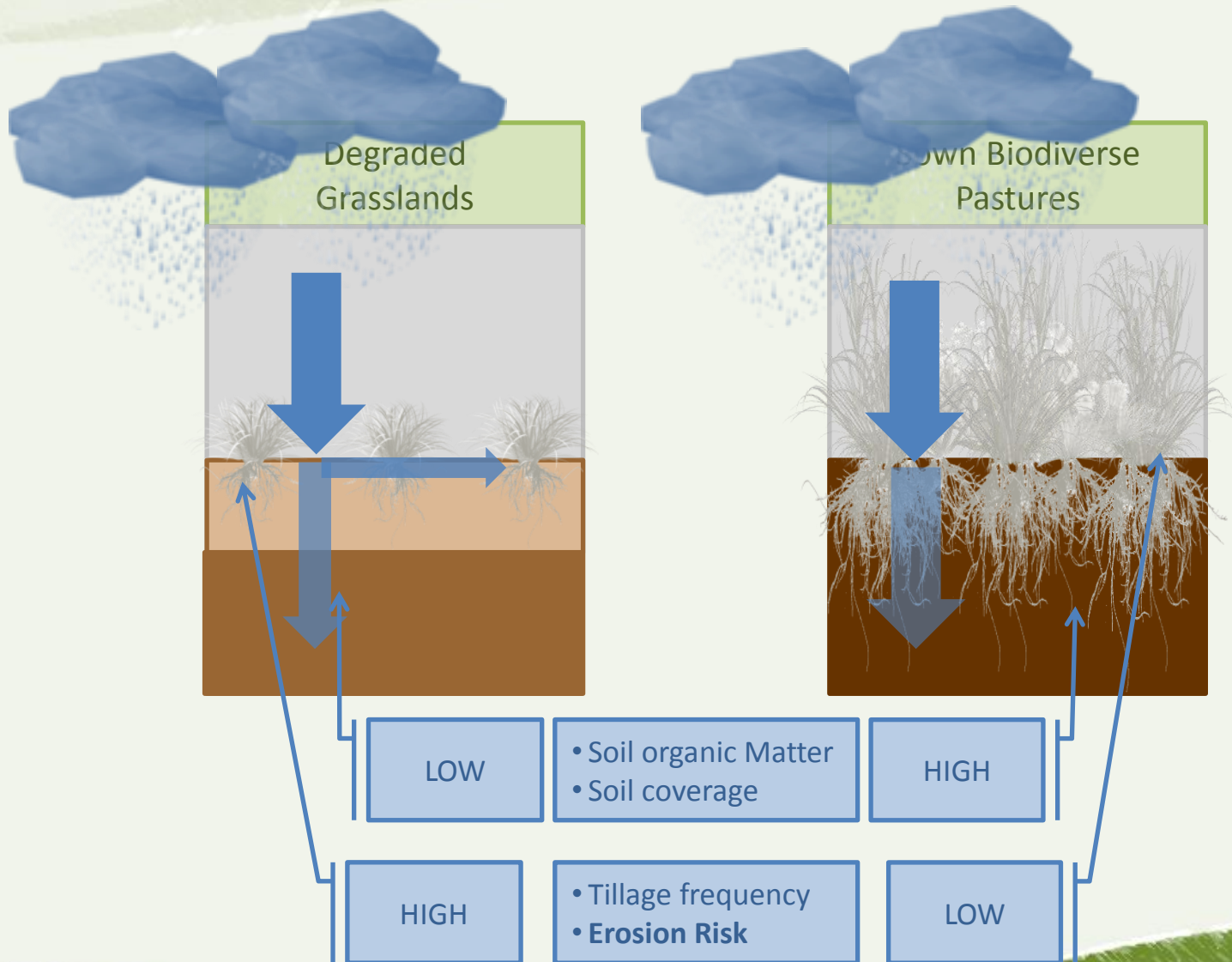
Teixeira, R., Domingos, T., Costa, A.P.S.V., Oliveira, R., Farropas, L., Calouro, F., Barradas, A.M., Carneiro, J.P.B.G. (2011). Soil organic matter dynamics in Portuguese natural and sown grasslands. *Ecological Modelling* 222: 993-1001

**10 year average
6,5 tCO₂/ha/y**

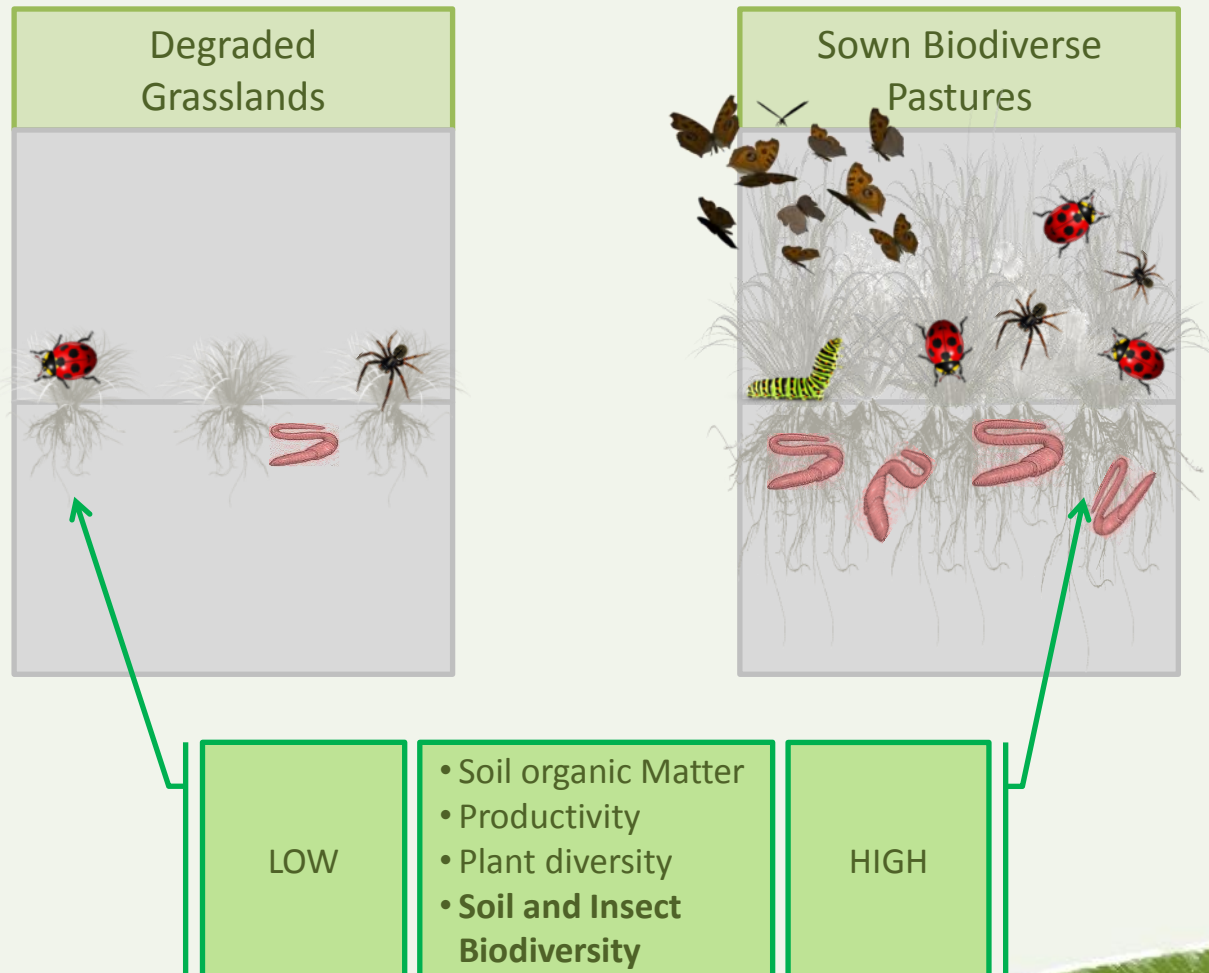
Comparing Systems: Water Retention Capacity



Comparing Systems: Erosion Risk



Comparing Systems: Biodiversity

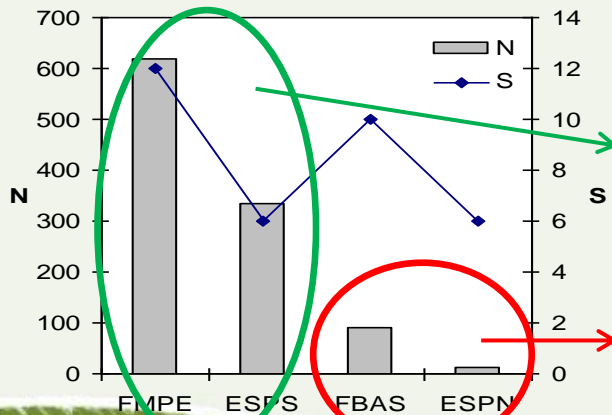


Measuring biodiversity (on-farm)

Insects



- Arthropods
- Coleoptera (Beetles)
- Carabidae (Ground beetles)



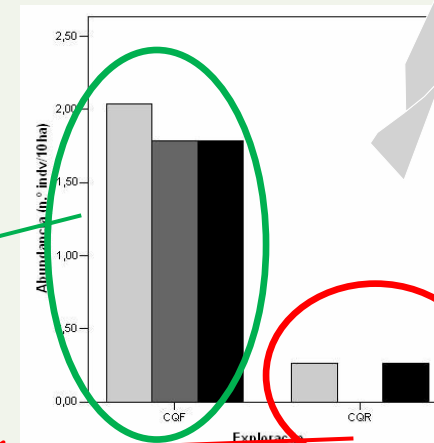
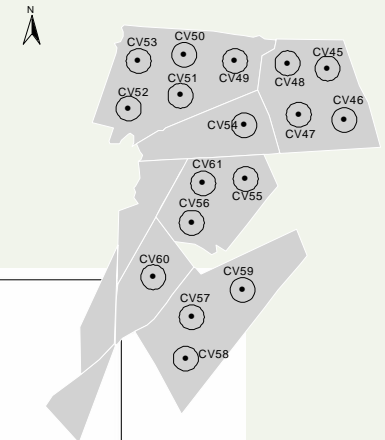
Sown AND organic pastures

Natural AND conventional pastures

Birds



- Birds typical of agro-forestry systems



Measuring biodiversity (off-farm)

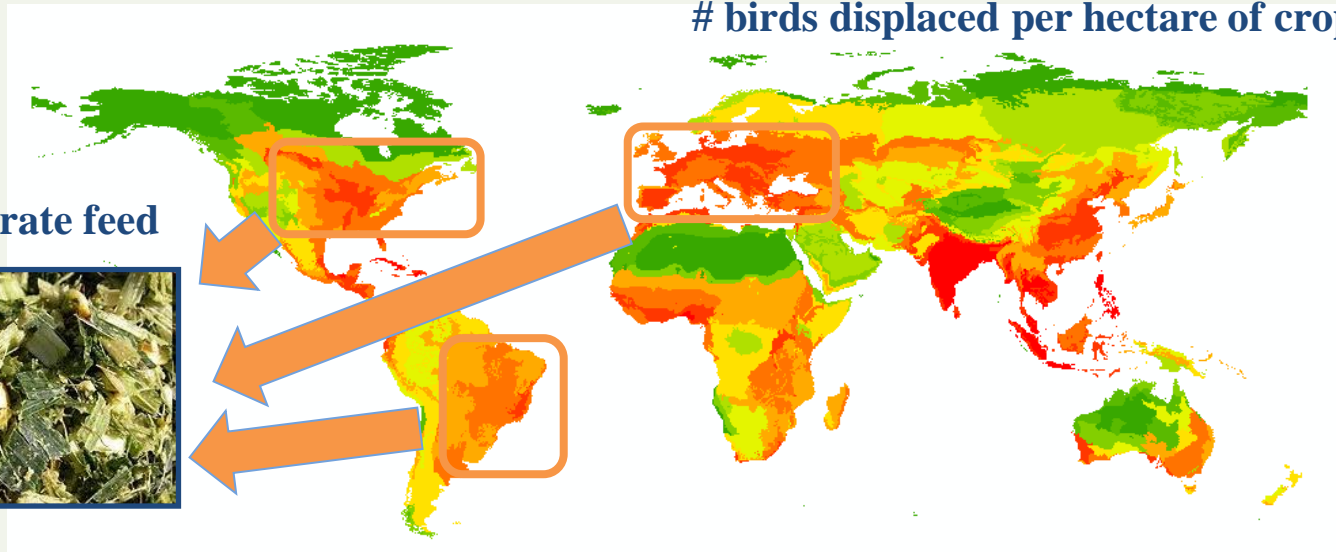


Concentrate feed



More damage from
crop production

birds displaced per hectare of cropland



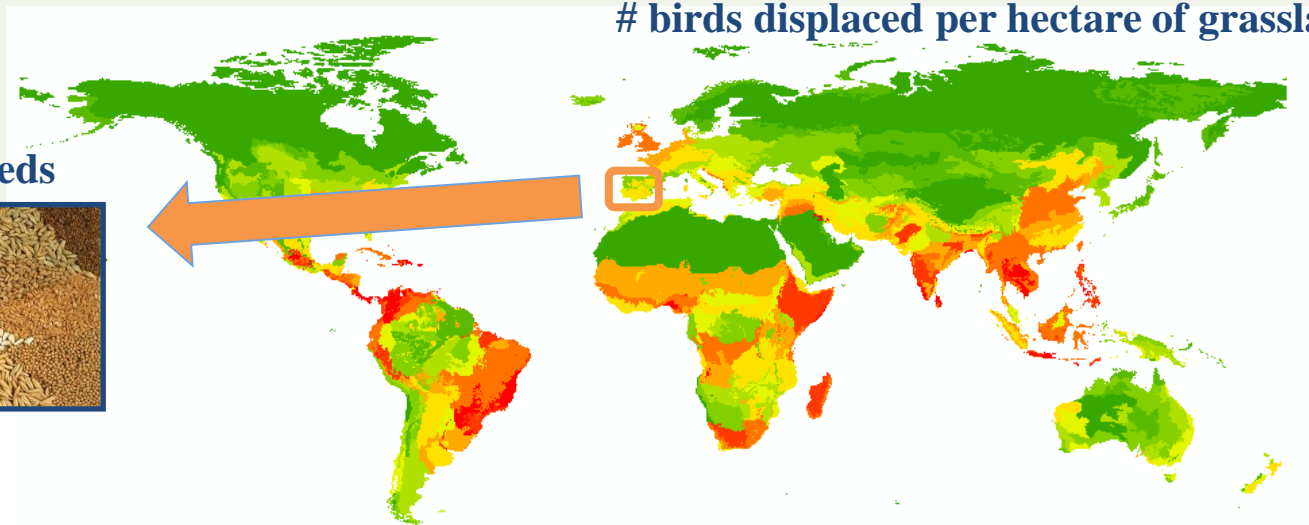
Vs.

Pasture seeds



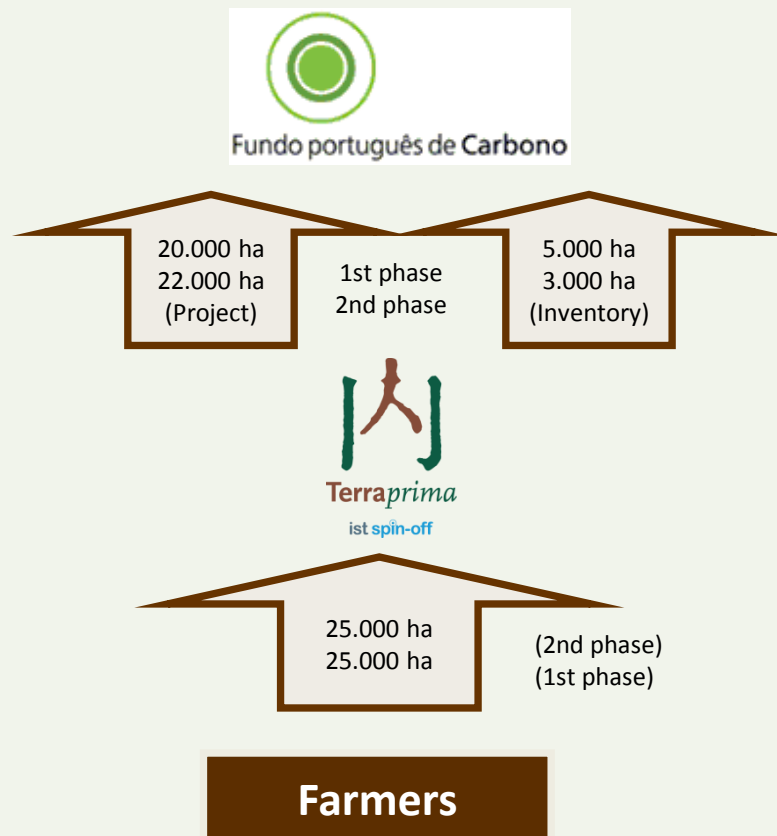
Less damage from
seed production

birds displaced per hectare of grassland



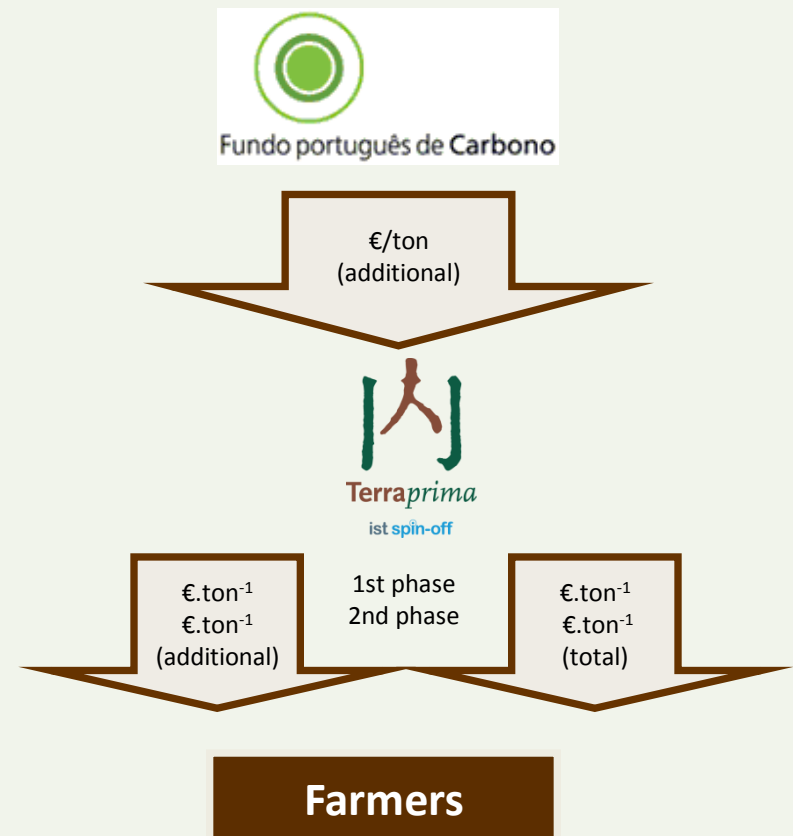
From research to innovation to adoption

Area paid



Some area is not additional, so it doesn't count for the Project, but is still paid
That not additional area is still monitored and counts for the National Inventory

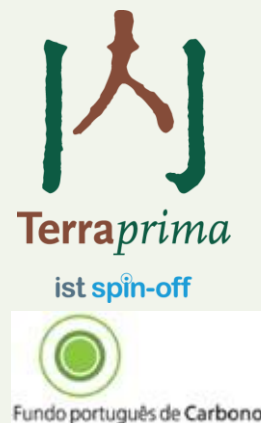
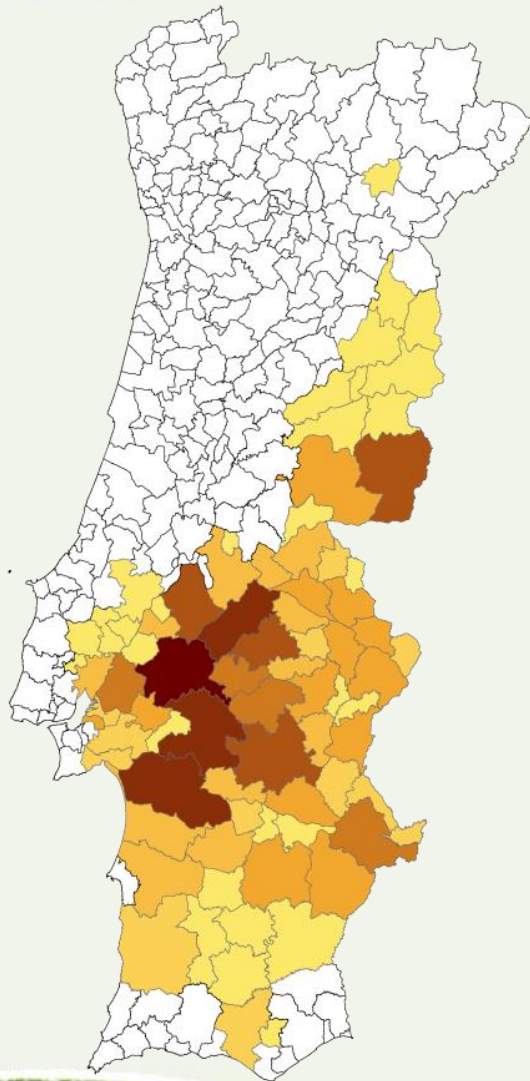
Money flow



Farmers are paid directly around 80% of the total sum
The rest goes to project management, technical support and monitoring

Project Sown Biodiverse Pastures

Project Terraprima/FPC 2009-2014

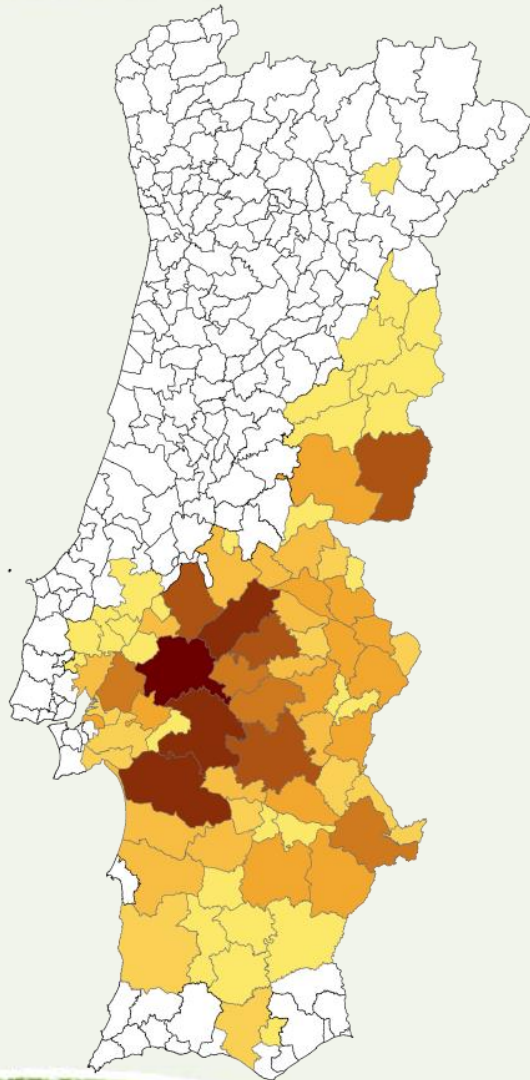


Sown Biodiverse Pastures

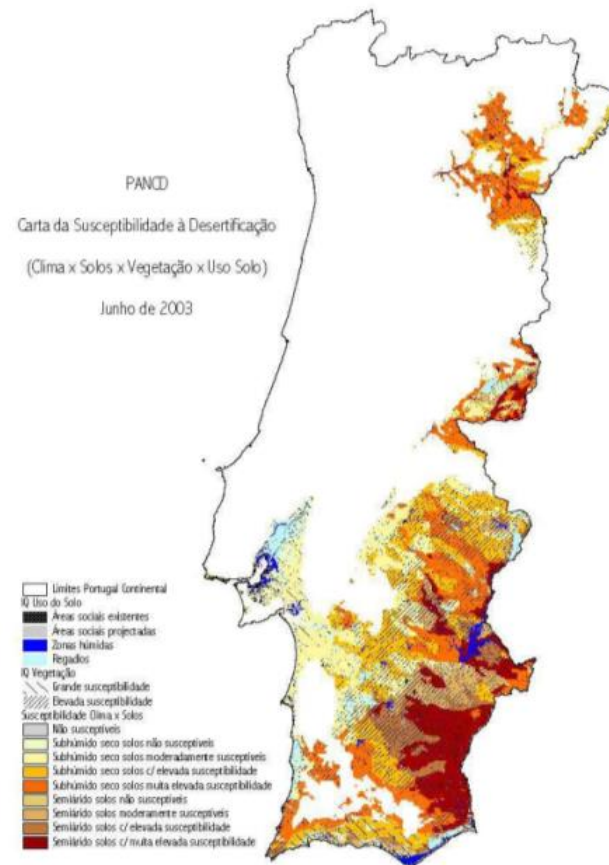
# Farmers	1 000
Area	50 000 ha
CO ₂ sold to Portuguese Carbon Fund	1 Mton

Project Sown Biodiverse Pastures

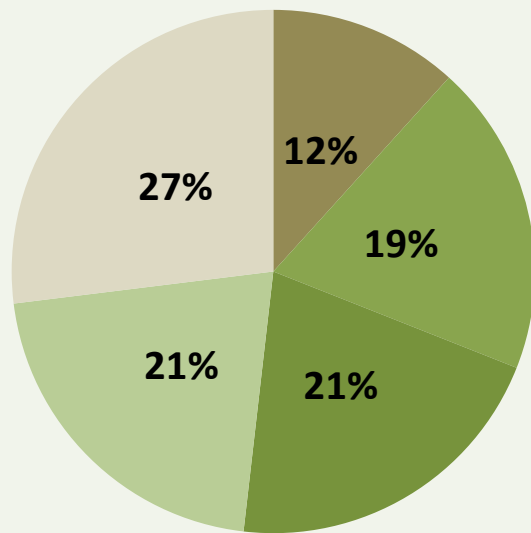
Project Terraprima/FPC 2009-2014



High susceptibility to desertification

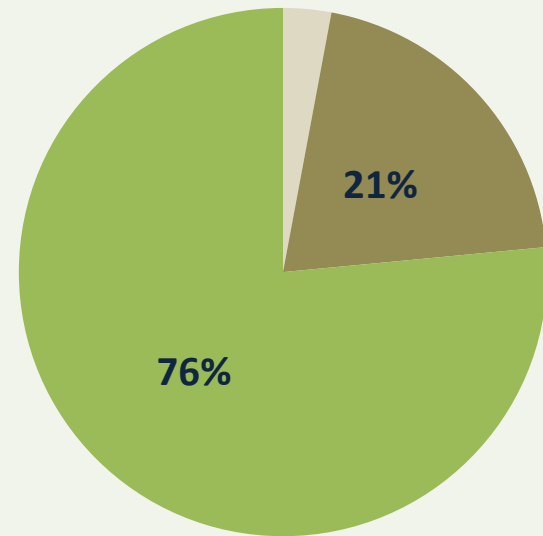


The advantages of SBP as perceived by farmers



■ Landscape improvement ■ Nitrogen fixation
■ Carbon sequestration ■ Soil conservation
■ Food for livestock

Farmers see themselves as providers of an environmental service



■ Agri-environment measure
■ Subsidy
■ Payment of an environmental service

Soil carbon sequestration as an environmental service

António Mendes D' Oliveira, (Herdeiros)

AGRICULTURA E PECUÁRIA

Contribuinte n.º 900 606 657

Tel. 045 / 52298 - 52351 - Herdade do Rebôlo

MOSTEIROS - 7340 Arronches

FACTURA

Nº 102

Data 24/09/2010

Ex.º Sr. TERRAPRIMA SERVIÇOS AMBIENTAIS, SOCIEDADE UNIPESSOAL, LDA

Morada QUINTA DA FRANÇA

CONTR. N.º 508759790 VEÍCULO CARIA

Quant.	DESIGNAÇÃO	Preço Unit.	IVA Taxa	Importância
	SEQUESTRO DE CARBONO EM			
	PASTAGENS SEMEADAS BIODIVERSAS			
	RIAS EM LEGUMINOSAS - PROGRAMA			
	DE APOIO A PROJECTOS NO PAÍS.			
19,08	HECTARES	50,72		967,74
			21%	203,22
	<i>[Signature]</i>			
	TOTAL			1170,96

Local de carg

Data / /

Hora saída

Local de descarga

Data / /

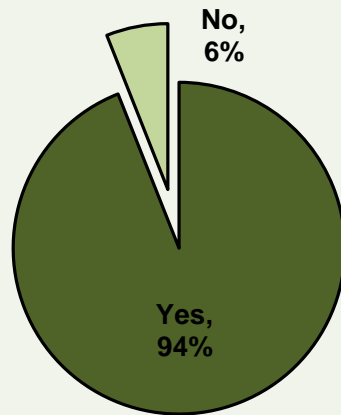
Hora prov.

Sown Biodiverse Pastures add value to farm products

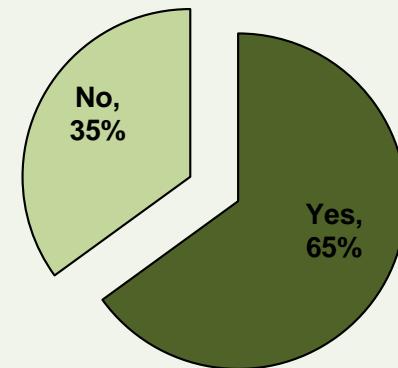
SBPPRL yield public (environmental) goods; is there any increase in the quality of private goods?

- **Surveys show that consumers value meat produced in SBPPRL and are willing to pay more for it – “Guaranteed Sustainability” Norm**

Potential consumer



Willingness to pay more?



How much?

An award winning project

Energy Globe 2014: National Award



<http://www.energyglobe.info/>

EU World you like Challenge 2013: Award for Best Portuguese Project



<http://world-you-like.europa.eu/en/>

UNCCD Dryland Champions 2013: Award winner



<http://www.unccd.int/en/programmes/Event-and-campaigns/Dryland%20Champions/Dryland%20Champions2013/Pages/default.aspx>

UNCCD Land for Life Competition 2012: Semi-finalist



<http://www.unccd.int/en/programmes/Event-and-campaigns/LandForLife/Pages/Land-for-Life-Award-Semi-Finalists.aspx>

More About Terraprima and the Project



<http://www.terraprima.pt/>



PME Líder'12

Recognised by
IAPMEI as a SME
Leader in Portugal

Terraprima is present on Facebook



<https://www.facebook.com/Terraprima.Protecting.Land>

Terraprima is present on Youtube



<http://www.youtube.com/user/terraprimaambiental>

This presentation was made in collaboration with the Terraprima team:



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Ivo Gama



Sara Manso



Ricardo Vieira



Paulo Canaveira